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The Swedish Patent Office PCT International Application

PCT/SE98/01982

## PATENT CLAIMS

Ahreaded implant (3) for obtaining reliable anchori $\mathbf{\hat{n}}$ g in bone substance (1), preferably in the jaw-bohe, in the human body, the bone substance being provided with a hole (2) in whose side wall is possible to establish an threading  $\setminus$  (1a) which can cooperate with an external threading (Ṣd, 3d´) on the implant for reliable anchoring and \healing-in of the implant in the bone substance, characterized in that the threading is akranged, particularly in the case of soft bone substance, to force the bone substance out in essentially radial directions (R) as a function of the extent\ to which the implant is screwed into the hole, the implant threading has a that slight conicity which extends along most or part of the length (L) of the implant and which cooperates with a circular cylindkical hole (2) in the bone (1) to effect greater foxcing out of the bone substance at the outer parts (2c) of the hole than at the inner parts (2d) of the hole, the degree of forcing out being adapted in relation to the softness of the bone substance in order to achieve the reliable anchoring, and that said conical threading comprises two or more thread spirals (thread enwhich, despite shortening the time screwing the implant into the hole provide a tight threading which permits effective integration with the bone substance during the healing-in process and counteracts deformation or breaking-up of fine the hole bone trabeculae which surround bone.

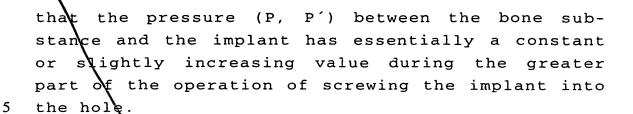
2. Implant according to claim 1, characterized in that the implant threading is arranged to ensure

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- 3. Implant according to claim 1 or 2, characterized in that the front portion (tip) (3a) of the implant is designed with a conical thread (3e) which has a conicity essentially exceeding the conicity of the slightly conical thread (3d).
- 4. Implant according to claim 3, characterized in that the conicity of the slightly conical thread is chosen between 0.1-0.4 mm or has an angle of inclination ( $\alpha$ ) of about  $0.5-2^{\circ}$ , and/or the thread conicity of the thread at the said portion/tip (3a) is of the order of 0.4-0.8 mm or with an angle of inclination ( $\beta$ ) of about  $10-15^{\circ}$ , and the portion/tip has a length or height (h) of about 10-30% of the length (L) of the threaded part of the implant.
- 5. Implant according to claim 1, characterized in that the implant threading along at least part of the longitudinal direction of the implant is given a noncircular or eccentric configuration (8a-8i) for the purpose of obtaining improved rotational stability of the implant in the recently inserted state or the incorporated state of the implant in soft/weak bone.
- 6. Implant according to claim 5, characterized in that the implant is arranged with a minimum diame-35 ter (D') which corresponds to or is slightly greater, for example 1 - 5% greater, than the diameter (d) of the hole.

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- 7. Implant according to claim 1 or any of claims 5-6, characterized in that the tip or the free end of the implant has a circular or concentric thread (3e) which merges gradually into a non-circular or eccentric thread on the remaining part or parts of the implant.
- 8. Implant according to claim 1 or any of claims 5-7, characterized in that the peripheris of the dif-10 ferent non-circular or eccentric thread cross-sections have bevelled corners (12) in order to avoid sharp corners.
- 9. Implant according to claim 1 or any of claims 515 %, characterized in that the non-circularity is arranged such that areas of maximum diameter are displaced in the peripheral direction from one thread
  turn (10) to the next thread turn (11).
- 20 10. Implant according to claim 1 characterized in that the number of thread spirals/thread entries is two, three or four.
- 11. Implant according to claim 10, characterized in that the number of thread spirals/thread entries is adapted to the number of cutting edges (5a, 5b, 5c, 5d) so that symmetrical cutting forces are obtained.
- 12. Implant according to claim 10 or 11, characterized in that two thread spirals are arranged on the implant together with two or four cutting edges, or in that three thread spirals are arranged together with three cutting edges, etc.

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